



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/834,770	04/13/2001	Nicolai Kosche	SUN-P5558-RJL	3758

7590

04/21/2004

A. Richard Park  
Park, Vaughan & Fleming LLP  
Suite 201  
508 Second Street  
Davis, CA 95616

EXAMINER

TANG, KUO LIANG J

ART UNIT	PAPER NUMBER
----------	--------------

2122

3

DATE MAILED: 04/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

BEST AVAILABLE COPY

## Office Action Summary

Application No.

09/834,770

Applicant(s)

KOSCHE ET AL.

Examiner

Kuo-Liang J Tang

Art Unit

2122

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2</u> . | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Claims 1-30 are pending and have been examined. The priority date for this application is 04/13/2001.

#### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3, 7-10, 11-13, 17-20, 21-23 and 27-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Crank et al., US Patent No. 5,583,988 (art of record, hereinafter Crank).

As Per Claim 1, Crank teaches that a method and apparatus for performing runtime checking during program execution in a compiled environment using the full ANSI-C programming language. (E.g. see Abstract and associated text). In that Crank discloses the method that covering the steps of a method for detecting violations of type rules in a computer program, comprising:

“receiving the computer program,” (E.g. see Fig. 29B-31B, c:\erik\ptrderef.c and associated text);

“locating a type casting operation (E.g. see Fig. 29B-31B, line 6 ( ptr = &a[11]) and associated text) within the computer program, wherein the type casting operation involves a first pointer and a second pointer,” (E.g. see Fig. 29B-31B and associated text. For Example, the first pointer is pointed to base of array a[], and the second pointer is pointed to the offset 10 (the 11<sup>th</sup> element of array a[]);

“checking the type casting operation for a violation of a type rule; and if a violation is detected, indicating the violation.” (E.g. see Fig. 29B-31B, Runtime Errors message and associated text).

As Per claim 2, the rejection of claim 1 is incorporated and further Crank teaches:

“wherein checking the type casting operation involves determining if the first pointer is defined to be a structure pointer (E.g. see Fig. 29B-31B and associated text, the first pointer is pointed to base of array a[]) and the second pointer is not defined to be a structure pointer (E.g. see Fig. 29B-31B and associated text, the second pointer is an offset to the base of array a[]), and if so, indicating a violation if no char exception applies.”.

As Per claim 3, the rejection of claim 2 is incorporated and further Crank teaches:

“generating a warning (E.g. see col. 19:45-48, warning) to warn a programmer of a potential type violation if the second pointer is a void or char pointer (E.g. see Fig. 11 and associated text) ; and

“generating an error to indicate a type violation to the programmer if the second pointer is a pointer to a scalar.” (E.g. see Fig. 29B-31B, Runtime Errors message and associated text).

As Per claim 7, the rejection of claim 1 is incorporated and further Crank teaches:

“wherein the computer program is received in source code form, and wherein the method further comprises parsing the computer program into an intermediate form prior to locating the type casting operation.” (E.g. see Fig. 27 library object code 1108 and associated text).

As Per claim 8, the rejection of claim 1 is incorporated and further Crank teaches:

“receiving an identifier (E.g. see Fig. 1B step 132 and associated text) for a set of constraints on memory references that a programmer has adhered to in writing the computer program;” and

“using the identifier to select a type casting rule from a set of type casting rules, the selected type casting rule being associated with the set of constraints; wherein each type casting rule in the set of type casting rules is associated with a different set of constraints on memory references.” (E.g. See Fig. 2A step 222 and associated text and See Fig. 11 and associated text).

As Per claim 9, the rejection of claim 1 is incorporated and further Crank teaches:

“wherein the method is performed by a compiler.” (E.g. see Fig. 1A step 44 and 107 and associated text).

As Per claim 10, the rejection of claim 1 is incorporated and further Crank teaches:

“wherein the method is performed by an error checking application, which is not part of a compiler.” (E.g. see Fig. 27 library object code 1108 and associated text).

As Per Claim 11, is the computer-readable storage medium claim corresponding to the method claim 1 and is rejected under the same reason set forth in connection of the rejection of claim 1.

Art Unit: 2122

As per Claims 12-13 and 17-20, the rejection of claim 11 is incorporated and are rejected under the same reason set forth in connection of the rejection of claims 2-3 and 7-10 respectfully.

As Per Claim 21, is the apparatus claim corresponding to the method claim 1 and is rejected under the same reason set forth in connection of the rejection of claim 1.

As per Claims 22-23 and 27-30, the rejection of claim 21 is incorporated and are rejected under the same reason set forth in connection of the rejection of claims 2-3 and 7-10 respectfully.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-6, 14-16 and 24-26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crank in view of SUN Microsystem, Inc "C User's Guide Supplement for the Forte Developer 6 update 1 (Sun Workshop 6 update 1)", Part No. 806-6145-10, October 2000, Revision A, XP-002242198 (art of recode, hereinafter SUN) further in view of Kosche et al. US Patent No. 6,718,542 (hereinafter Kosche).

As Per claim 4, the rejection of claim 1 is incorporated and further Crank teaches "wherein if the first pointer is defined to point to a first structure type (E.g. see Fig. 11, col. X ,

Art Unit: 2122

row 9 (struct) and associated text) and the second pointer is defined to point to a second structure type (E.g. see Fig. 11, col. Info , row 9 (STRUCT) and associated text), “ and “generating an error to indicate a type violation” (E.g. see Fig. 29B-31B, Runtime Errors message and associated text). Crank does not explicitly disclose determining whether the first structure type and the second structure type belong to the same alias group. However, SUN, in an analogous art, discloses the use of “the first structure type and the second structure type belong to the same alias group;” (E.g. see SUN page 12, Example 3, `bp = (struct bar *) (&fp->f2)` and associated text, e.g. at page 12, last paragraph, `fp->f2` and `bp->b2` do not alias.) but does not explicitly disclose how to determine whether such structure types belong to the same alias group. Kosche, however in an analogous art, further discloses such a known determining step (E.g. see Kosche art col. 21:50). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of SUN and Kosche into the system of Crank, to determine whether the first structure type and the second structure type belong to the same alias group. The modification would have been obvious because one of ordinary skill in the art would have been motivated to make sure that there is no type violation happens during program compilation.

As Per claim 5, the rejection of claim 4 is incorporated and further Crank does not explicitly disclose keeping track of special program statements that link structure types into alias groups; determining that the first structure type and the second structure type belong to the same alias group if the first structure type and the second structure type are the same structure type, or if one or more special procedures link the first structure type and the second structure type into

Art Unit: 2122

the same alias group. However, in an analogous art, SUN discloses “keeping track of special program statements that link structure types into alias groups (E.g. See SUN page 18, Example 7, line 3, “pragma alias (struct foo, struct bar)” and associated text) and the use of the first structure type and the second structure type belong to the same alias group; (E.g. see SUN page 12, Example 3,  $bp = (\text{struct bar } *) (\&fp \rightarrow f2)$  and associated text, e.g. at page 12, last paragraph,  $fp \rightarrow f2$  and  $bp \rightarrow b2$  do not alias.) but does not explicitly disclose how to determine whether such structure types belong to the same alias group. Kosche, however in an analogous art, further discloses such a known determining step (E.g. see Kosche art col. 21:50). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of SUN and Kosche into the system of Crank, to track of special program statements that link structure types into alias groups and determine whether the two types belong to the same alias group. The modification would have been obvious because one of ordinary skill in the art would have been motivated to prevent type violation happening during program compilation.

As Per claim 6, the rejection of claim 5 is incorporated and further the combination of Crank and SUN do not disclose such a determining step. Kosche, however in an analogous art, further discloses “determining that the first structure type and the second structure type belong to the same alias group if the first structure type and the second structure type have all the same basic types in the same order” (E.g. see Kosche col. 21:50 and col. 2:46-49). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teaching of Kosche into the system of Crank as modified by SUN, to track of



Art Unit: 2122

special program statements that link structure types into alias groups and determine whether the two types belong to the same alias group. The modification would have been obvious because one of ordinary skill in the art would have been motivated to prevent type violation happening during program compilation.

As per Claims 14-16, the rejection of claim 11 is incorporated and are rejected under the same reason set forth in connection of the rejection of claims 4-6 respectfully.

As per Claims 24-26, the rejection of claim 21 is incorporated and are rejected under the same reason set forth in connection of the rejection of claims 4-6 respectfully.

Art Unit: 2122

*Conclusion*

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kuo-Liang J Tang whose telephone number is 703-305-4866.

The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q Dam can be reached on 703-305-4552.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9306.

*Kuo-Liang J. Tang*

Software Engineer Patent Examiner



**TUAN DAM  
SUPERVISORY PATENT EXAMINER**